

REMARKS/ARGUMENTS

1.) Claim Amendments

The Applicants have amended claims 1, 2, 4, 6, 11, 12, 16, 18-20, 23, and 25-28. Claims 5, 14, 15, 21, 22 and 24 have been canceled. Claims 29-34 have been added. Accordingly, claims 1-4, 6-13, 16-20, 23, and 25-34 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

2.) Claim Rejections – 35 U.S.C. § 112

On Page 2 of The Office, The Examiner rejected claims 1-13 and 25-26 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner stated that the claim limitation, "SID frames prior to transmission are interleaved using a different interleaving algorithm as compared to that used for the channel encoded source data" contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Applicants have amended the claims to eliminate the phrase "prior to transmission". The remainder of the claim limitation is clearly described in numerous locations throughout the specification. For example page 10, lines 15-16 states, "For example, the source data can be block diagonally interleaved, and certain of the SID frames can be block interleaved." Channel encoding of the source data is described on page 14, lines 3-12. Therefore, the withdrawal of the § 112 is respectfully requested.

3.) Claim Rejections – 35 U.S.C. § 103(a)

On Page 2 of the Office Action, The Examiner rejected claims 1-28 under 35 U.S.C. § 103(a) as being anticipated by Hamalainen et al. (US 6,477,176 B1), hereinafter Hamalainen, in view of Bruhn (US 6,347,081 B1). The Applicants have

amended the claims to better distinguish the claimed invention from Hamalainen and Bruhn. The Examiner's consideration of the amended claims is respectfully requested.

The Applicants have amended the independent claims to recite that the communication system is an adaptive multi-rate (AMR) communications system. Hamalainen does not show an AMR system, and therefore does not address the need to convey codec mode information to keep link adaptation going. Likewise, Bruhn does not address this problem during DTX or escape (configuration change) signaling. There is no teaching or suggestion in Bruhn of including codec mode information in the SID frames.

Furthermore, Bruhn does not disclose or suggest interleaving the SID frames such that certain of the transmitted SID frames are interleaved using a different interleaving algorithm as compared to that used for source data. Bruhn relates to a method for reducing power during periods of speech inactivity for the GSM system. The system transmits SID frames at a reduced power level using all or at least a part of the available so far unused frames. (Col. 3, lines 22-29). Bruhn proposes repeatedly transmitting a SID frame at a lower power level. As a consequence of this way of providing protection against channel errors, it does not matter whether or not interleaving is applied to the SID frames.

For the special case of discontinuous soft DTX, Bruhn suggests to *disable* diagonal interleaving in order to avoid the wasting of gross bits arising from the need to transmit two consecutive frames for one diagonally interleaved SID frame. (Col. 8, lines 15-35). Bruhn alternatively proposes to *keep diagonal interleaving* but to apply special means to fill up those channel frame parts with gross bits which otherwise are wasted.

Thus, according to Bruhn, the SID frames are either interleaved using the same interleaving algorithm as for source data, or the SID frames are not interleaved at all. The preferred teaching in Bruhn is clearly to not interleave the SID frames at all because these frames are repeatedly transmitted at a low power level over a number of frames such that interleaving for the SID frames would not be particularly beneficial. Accordingly, Bruhn does not disclose or suggest interleaving the SID frames such that certain of the transmitted SID frames are interleaved using a different interleaving algorithm as compared to that used for source data.

As noted, the present invention addresses a problem arising in AMR communications systems which adopt discontinuous transmission (DTX). Conventionally, so-called silence descriptor frames are transmitted once per 24 frames over the currently inactive link. The silence descriptor frame may for example serve to transmit comfort noise information over the inactive link, as is well known. DTX using SID frames serves to save radio resources by lowering the interference level. Typically, SID frames do not differ from speech frames in the way channel encoding is done. Conventionally, both speech frames as well as SID frames are subjected to block diagonal interleaving such that the radio subsystem can handle the SID frames as regular speech frames, as described in the last paragraph on page 4 of the present application.

The present invention addresses the problem of how to incorporate AMR functionality into a communications system using DTX. An AMR communications system must be able to communicate from the presently listening end to the presently speaking end, that is over the inactive link, information regarding the codec mode to be used. This information must be transmitted sufficiently frequently and in a manner that enables fast detection of codec mode changes in order to be able to cope with the time varying characteristics of the channel. (See the first and third paragraph on page 8 of the original application.)

The present invention solves this problem by providing DTX in an AMR communications system in which silence descriptor frames are transmitted from a first to a second component during the periods of source data inactivity, wherein the SID frames are interleaved for transmission. As defined in the independent claims, the communication is adaptive multi rate and the silence descriptor frames include codec mode information. Certain of the transmitted SID frames are interleaved using a different interleaving algorithm as compared to that used for source data.

Since the present invention interleaves the transmitted SID frames, some of them with a different interleaving algorithm than that used for source data, the SID frames can be used also for carrying codec mode information required for the adaptive multi-rate system. Adopting a different interleaving scheme for the SID frames enables the frequency of the SID frames to be adjusted to the needs of an efficient AMR

communication system without sacrificing too much of the benefits of DTX. In this respect it is particularly advantageous to use an interleaving scheme like block diagonal interleaving for interleaving speech frames, and to use an interleaving scheme for the SID frames which does not lead to partially unused transmission bursts and which allows fast detection of codec mode information. In this particular example, it would be possible to transmit twice as many SID frames, due to the fact that some of the SID frames are interleaved differently than the source data. The increased frequency in transmitting the SID frames and the reduced transmission delay due to the different interleaving scheme then allows the SID frames to be used for carrying adaptive multi-rate codec mode information over the inactive link.

Amended claim 1 recites an AMR communication system, the use of SID frames to carry codec mode information, and interleaving SID frames using a different interleaving algorithm as compared to that used for the channel encoded source data. These features are not taught or suggested by the combination of Hamalainen and Bruhn. Therefore, the allowance of amended claim 1 is respectfully requested.

Claims 2-4 and 6-13 depend from amended claim 1 and recite further limitations in combination with the novel elements of claim 1. Therefore, the allowance of claims 2-4 and 6-13 is respectfully requested.

Amended independent claim 16 recites a method for effecting configuration changes in an AMR communications system. A first component transmits an escape frame in place of a source data frame to indicate a configuration change to a second component. The escape frame includes codec mode information and a gross bit pattern to distinguish the escape frame from speech data frames. Hamalainen does not show an AMR system, and therefore does not address the need to convey codec mode information to keep link adaptation going. Likewise, Bruhn also fails to address this problem. Therefore, the allowance of amended claim 16 is respectfully requested.

Claims 17-20, 23, and 31-34 depend from amended claim 16 and recite further limitations in combination with the novel elements of claim 16. Therefore, the allowance of claims 17-20, 23, and 31-34 is respectfully requested.

Amended independent claim 25 recites a transmission component for transmitting channel encoded and interleaved source data frames to a receiving component in an AMR communications system. The transmission component includes means for detecting periods of source data inactivity; and means for transmitting interleaved silence descriptor (SID) frames during the periods of source data inactivity. The SID frames include codec mode information, and at least some of the SID frames are interleaved using a different interleaving algorithm as compared to that used for the channel encoded source data frames. Thus, amended claim 25 corresponds to method claim 1. Therefore, the allowance of amended claim 25 is respectfully requested for the reasons discussed above for claim 1.

Claim 26 depends from amended claim 25 and recites further limitations in combination with the novel elements of claim 25. Therefore, the allowance of claim 26 is respectfully requested.

Independent claim 27 has been amended to recite a transmission component for transmitting source data frames to a receiving component in an AMR communications system. The transmission component includes means for transmitting an escape frame in place of a source data frame to indicate a configuration change to the receiving component, wherein the escape frame includes codec mode information and a gross bit pattern to distinguish the escape frame from source data frames. Thus, claim 27 corresponds to method claim 16. Hamalainen does not show an AMR system, and therefore does not address the need to convey codec mode information to keep link adaptation going. Likewise, Bruhn also fails to address this problem. Therefore, the allowance of amended claim 27 is respectfully requested.

Claims 28-30 depend from amended claim 27 and recite further limitations in combination with the novel elements of claim 27. Therefore, the allowance of claims 28-30 is respectfully requested.

4.) Prior Art Not Relied Upon

On Page 7 of the Office Action, the Examiner stated that the prior art made of record and not relied upon is considered pertinent to the Applicants' disclosure. The

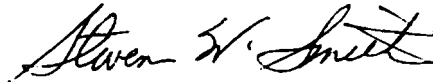
Applicants contend that the newly presented claims are not taught or suggested by the prior art of record.

5.) Conclusion

In view of the foregoing remarks, the Applicants believe all of the claims currently pending in the Application to be in a condition for allowance. The Applicants, therefore, respectfully request that the Examiner withdraw all rejections and issue a Notice of Allowance for claims 1-4, 6-13, 16-20, 23, and 25-34.

The Applicants request a telephonic interview if the Examiner has any questions or requires any additional information that would further the prosecution of the Application.

Respectfully submitted,



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